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the side opposite to the side where the joint portion 8 between the two display panels 2a and 4a is located.

FIGS. 23 and 24 are views showing another embodiment of the display device according to the present invention, where the outer electrode is provided at the side opposite to the joint portion of the supporting member.

FIG. 23 shows the outer electrode 2k comprising the outer electrode arrays 51, 52 and 53 for coupling the driving driver supplying the data signal and common signal to the display panel 2a. The electrode 2k is disposed at the opposite side to the joint portion 8 of the supporting member 160. The coupling electrodes 52a and 53a, or the outer electrode array 51, 52 and 53 are not disposed at the joint portion 8 of the display panel 2a, thereby minimizing the non-display area.

A circuit coupler 2e is coupled to the outer electrode 2k for transferring the signals from the driving circuit to the display panel. The supporting member 160 is mounted on the panel housings 20 and 40 or on the chassis 16 by the fixing plate 161 with a screw hole 161a.

The circuit coupler 2e is disposed at the opposite side to the joint portion 8 to minimize the width of the joint portion 8.

Although, the sidewall of the display panel 2a is exposed at the side of the joint portion 8 of the supporting member 160, if necessary, such exposure may be prevented or the synthetic resin may be applied at the sidewall of the display panel or back light for its protection.

FIG. 24 shows two supporting members symmetrically assembled each other. When the panel housings 20 and 40 are unfolded, the supporting members 160 with the display panels 2a and 4a are symmetric around the joint portion 8.

As shown in the drawing, the outer electrodes 2k of the display panel 2a in the supporting member 160 are located at the opposite side to the joint portion 8, and the display panel 2a is coupled to the driving circuit board via the circuit couplers 2e and 4e.

FIGS. 25 and 26 show the chassis wherein the supporting member is mounted thereon.

As shown in the drawings, the upper portion of the joint portion 8 in the chassis 16 is not covered, but the side is covered. The sidewall of the chassis around the joint portion is thinner than other area thereof. Therefore, the non-display area may be minimized.

Also, as shown in FIG. 26, the sidewall of the chassis 16 around the joint portion may be opened, so that the sidewall of the display panel 2a is exposed. In this case, a protecting layer of synthetic resin is applied the sidewalls of the display panels 2a and back light.

Furthermore, when the display panel 2a is mounted on the chassis 16, as shown in the drawing, the outer electrode 2k, where the electrode arrays 51, 52 and 53 for transferring the data signals and common signals are provided therein, is arranged at the opposite side to the joint portion 8 of the chassis 16. However, the outer electrode 2k is covered by an upper portion of the chassis 16.

The chassis 16 may be mounted on the panel housing by means of a chassis fixing plate 16c.

When the connecting joint portion of the supporting member 160 or chassis 16 are assembled in the openings or the connecting joint portion of the panel housing 20 and 40, and thus the outer electrode 2k is disposed at the connecting joint portions 20a and 40a or opening 8b of the panel housing 20 and 40.

When the display panels 2a and 4a are mounted on the panel housings 20 and 40, both the supporting member 160 or chassis 16 may not be used, so the supporting member 160 may become the chassis 16.

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That is, the supporting member and chassis are merely an protecting member which may be integrated as a module for display panel and circuit board. The supporting member 160 may be commonly made of plastic materials and the chassis 16 may be made of metal such as aluminum.

INDUSTRIAL APPLICABILITY

As described above, the present invention provides a foldable type portable display device for realizing the large-sized screen with the joint portion as non-display area between the two or more display elements is minimized.

According to the present invention, the non-display area as the joint portion may be compensate by means of the optical elements, and the driving signals are divided and transferred to the two display elements for realizing a single large-sized screen.

The invention claimed is:

1. A portable display device comprising:

at least two display elements;

at least two foldable panel housings receiving the display elements, electronic components, and other parts, respectively;

a joint portion in which the display elements are adjacent to each other when the display elements are unfolded;

a display panel being configured to form each display elements;

an outer electrode disposed on one side of each display element;

a driver mounted on the display panel to drive the corresponding display element; and

pixel electrodes disposed on the display panel,

wherein the display elements are disposed adjacent to each other when the panel housings are unfolded and the distance between the adjacent display elements is less than 3 mm,

the pixel electrodes are connected to the outer electrode through a coupling electrode in order to dispose the outer electrode on one side of the display panel, and the coupling electrode passes by the edge of the display panel,

the coupling electrode couples the pixel electrodes in the y direction to the outer electrode in the x direction and couples the pixel electrodes to the outer electrodes so as to exchange the horizontal direction and the vertical direction,

the display elements are driven by selecting one of a method of sending signals to the display driving parts by dividing data signals and a method of sending the signals to the display driving parts by dividing common signals, the same data signals are supplied to the display elements when supplying the divided common signals to the display elements and the same common signals are supplied to the display elements when supplying the divided data signals, and

the driver is formed in a single chip so as to output the common signals and the data signals from the single chip and is mounted on each display element.

2. A portable display device of claim 1, wherein the display device further comprises a protecting member or optical elements on the top of the display elements, and the distance from a pivotal center of the panel housings to the protecting member or optical elements is less than 1 mm.

3. A portable display device of claim 1, wherein a non-display area of the display panel is less than 1 mm in a joint portion of the display panel.